

# EDA CAPTECH SPACE

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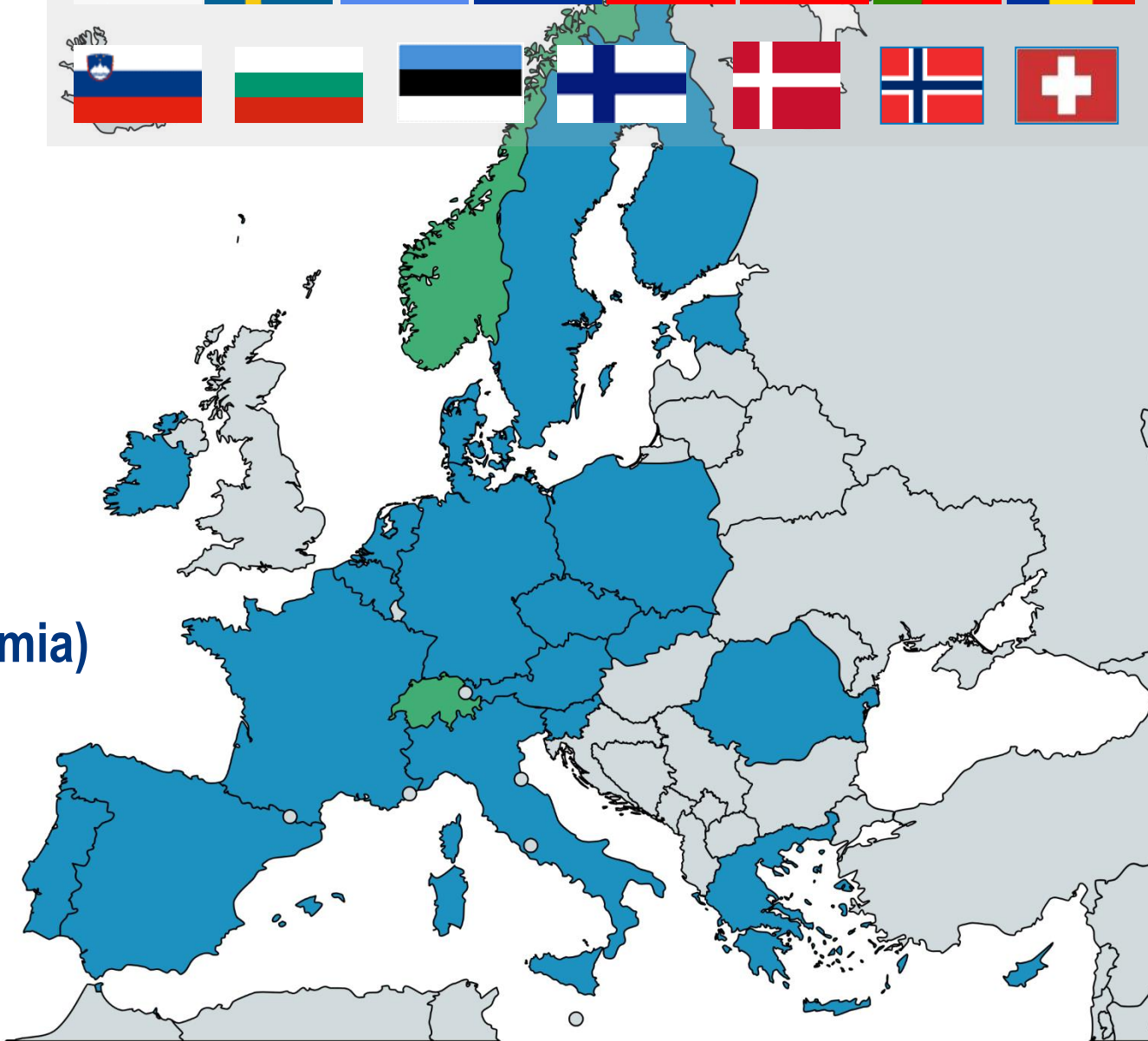


# CAPTECH SPACE COMPOSITION

The CapTech Space is the biggest defence R&T community for space in Europe

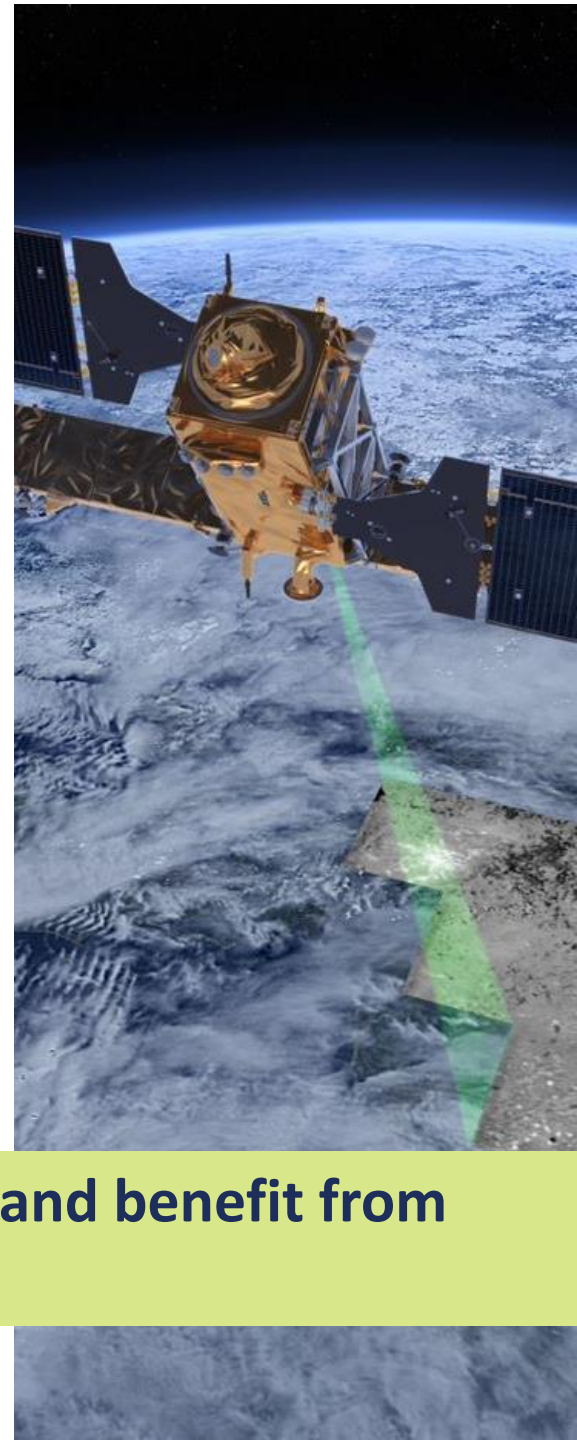
**23** Member States (inc. NO + CH)

**~550** Participants  
(MS, industry & academia)



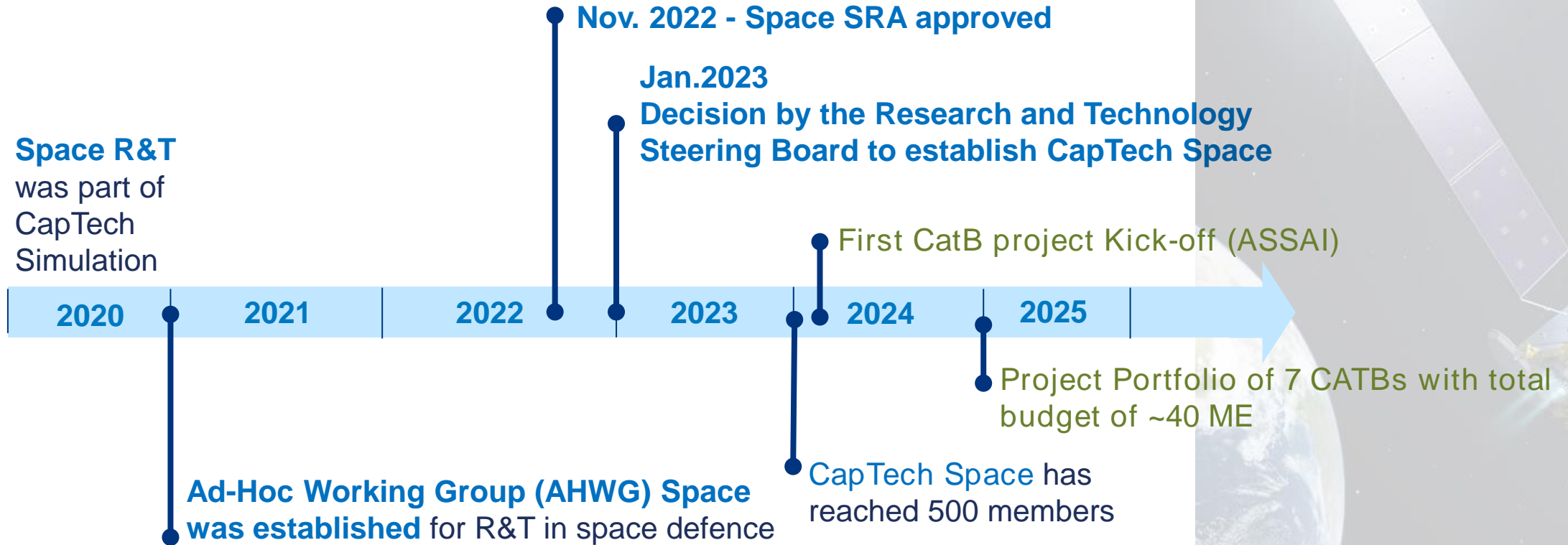
## CAPTECH SPACE - OBJECTIVES

- Coordinate and strengthen R&T for Space Defence in Europe.
- Overcome shortfalls and support new defence and security capabilities in the space domain.
- Foster innovative cooperation among the MS in R&T.
- Act as an interface between MoDs and industry for achieving European autonomy.
- Generate innovative collaborative R&T projects.



**For Europe to autonomously deploy, operate, and benefit from space capabilities in the defence domain.**

# CAPTECH SPACE TIMELINE



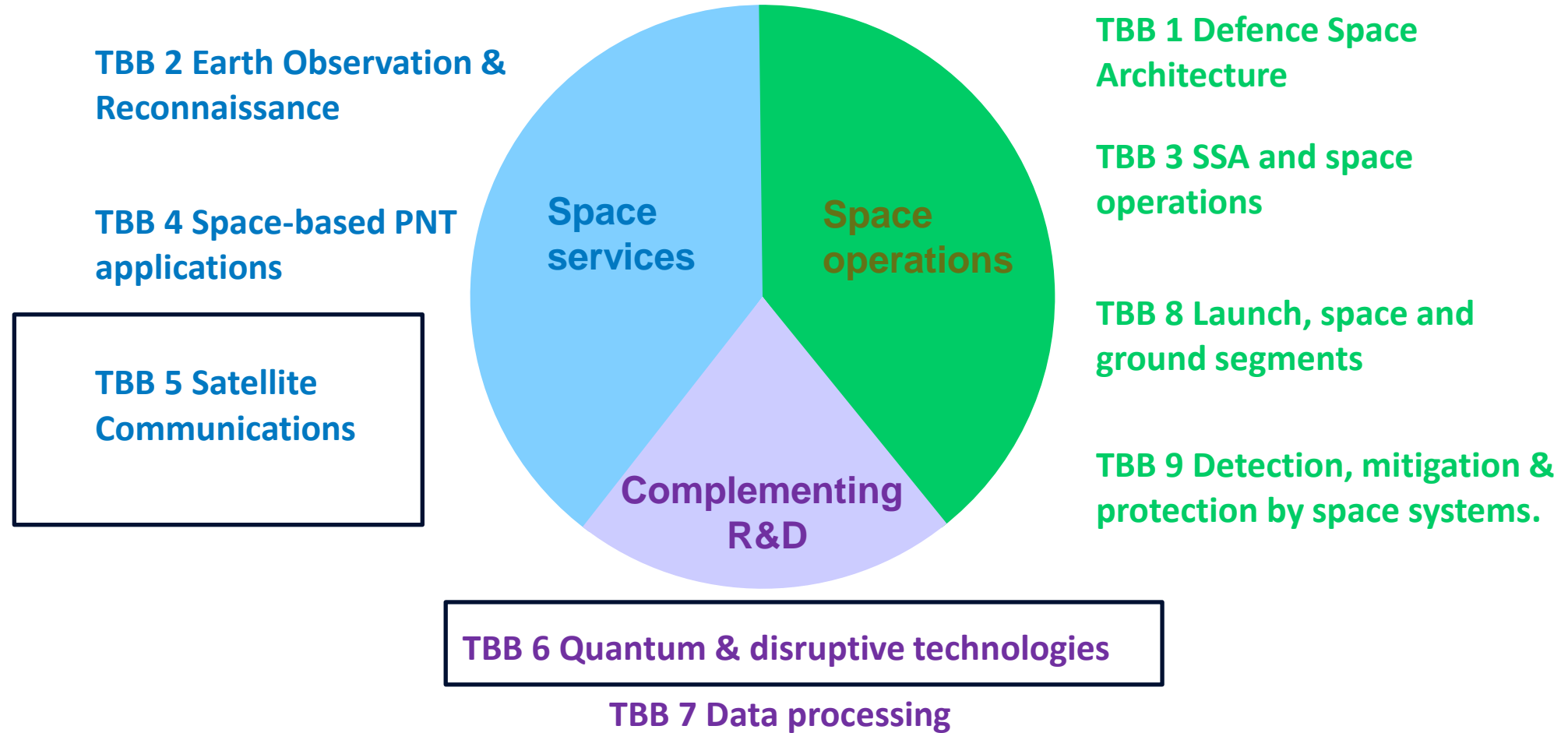
# MEETINGS

- Three physical meetings per year (2.5 days each)
- The 6th CapTech Space Meeting & Industry Workshop will be in Warsaw, 26-28 November 2024



On average 120 participants in our Industry workshops.

# TECHNOLOGY BUILDING BLOCKS

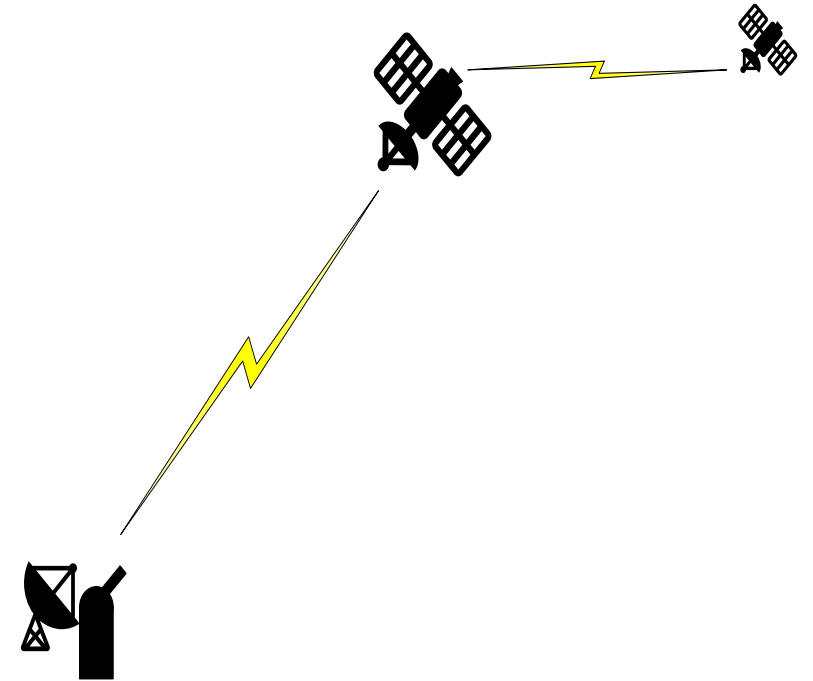


# SATELLITE COMMUNICATIONS - KEY TECHNOLOGIES AND R&T NEEDS

- Optical communication (through laser), modulated retro-reflectors (for lasers).
  - space-to-space (inter- satellites); ground to LEO and LEO to ground; ground to GEO; air to space; sea to space.
- High-frequency (HF) and laser space-based communication systems on constellations of small satellites in low earth orbits
  - to provide communication with and between military forces, vehicles, drones and spacecraft.
- Optical signal carriers in the near- infrared band are used in free space to establish inter-satellite/deep space links or ground-to-satellite/satellite-to-ground links.
- Light Emitting Diodes (LEDs) for optical communication.

# PROJECT IN THE PLANNING PHASE

- Hybrid RF/Optical technologies overcome the shortcomings of the optical communication due to atmospheric attenuation, while maintaining the advantage of the high data rates.
- Providing robust high data rates bi-directional LEO-Ground link as well as Inter-satellite links.
- Challenge in Defence and Security,
  - Data volumes of some tens of Tbits/day thanks to optical and ISM payloads.
  - High-speed data chain requires achieving several Gbit/s in the data transmission from LEO to Ground (and vice versa).





# QUANTUM AND OTHER DISRUPTIVE TECHS FOR SPACE APPLICATIONS

- Project scopes is related to projects linked to the use of quantum technology to establish ultra-highly trusted and **secured networks** for exchanging information in the frame of space communications.
  - Quantum/Photonic components for communication
  - Photonic/Optical Materials & Device Technology

# CRITICAL SPACE TECHNOLOGY FOR EUROPEAN STRATEGIC NON-DEPENDENCE 2024-2026



- Map the current situation of European dependency and identify actions and roadmap.
- **5 cycles** in 2009, 2011, 2014, 2016 and 2020.
  - The new cycle covers the timeframe of 2024-2026.
  - Optical components.
  - Industry and MS can access the list upon approval.



## EC-ESA-EDA Joint Task Force: Timeline



# OTHER RELEVANT EDA R&T ACTIVITIES

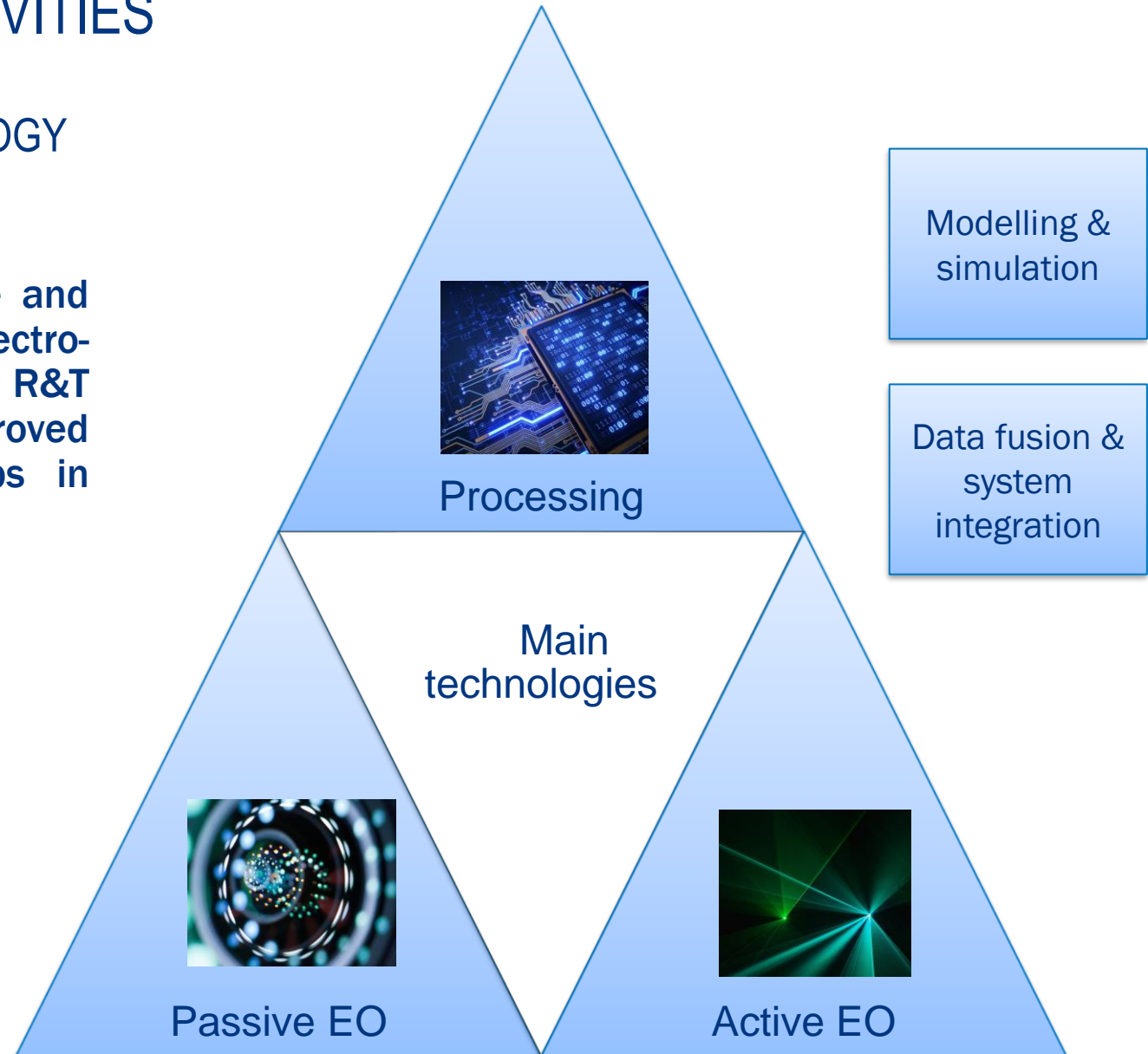
## CAPTECH OPTRONICS

### ELECTRO-OPTICAL SYSTEMS & TECHNOLOGY

The Optronics CapTech aims to propose and coordinate R&T activities in the field of Electro-optical systems. The results of the R&T activities will enable significantly improved defence capabilities on identified gaps in military needs

#### Connection to SPACE

- EO sensors on satellites
  - Hyperspectral
  - EO/IR
- Laser communication



# POSSIBLE INVOLVEMENT

- Member States can pursue collaboration for R&T in CapTech Space
  - through their participation in Category-B (CATB projects)
  - using the TBB roadmaps (the 159 projects);
  - propose new projects not included in the roadmaps;
- Projects are co-funded by the MS and supported with industrial contribution.
- Industry can submit a request to join the CapTech Space to the moderator.





**Thank you for your attention!**